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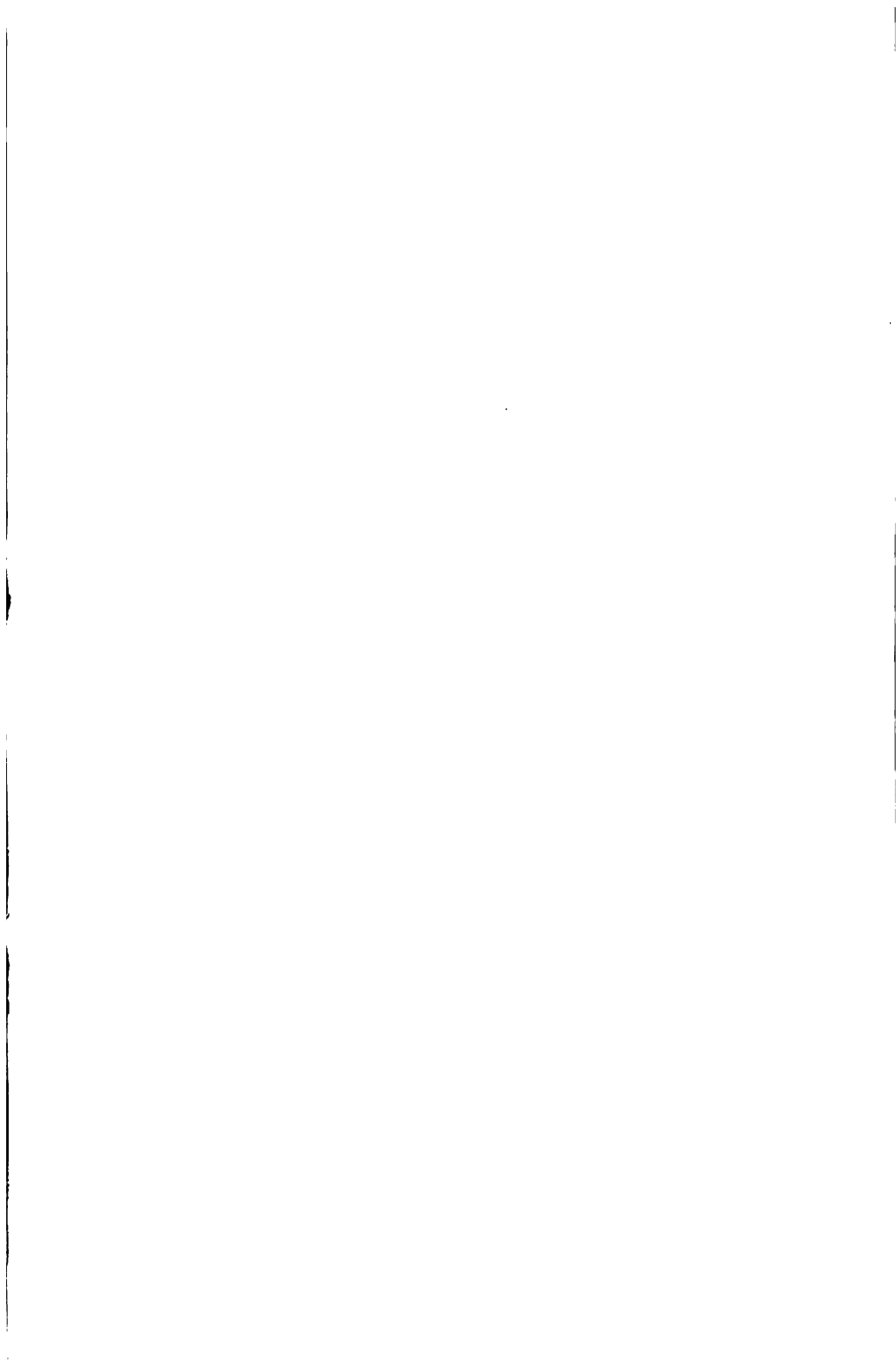
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HOME CALISTHENICS.

A GUIDE TO HEALTH
FOR WOMEN AND CHILDREN.

*"And in the symmetry of her parts is found
A power like that of harmony and sound."*

BOSTON:
EDUCATIONAL PUBLISHING COMPANY,
1890.

HARVARD UNIVERSITY
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INTRODUCTION.



THE health of coming generations and the future of a nation depend in great part upon the girls. They are to be the coming mothers ; and, as such, obligations for the formation of a new race are incumbent upon them. These obligations they can by no means fulfill unless they are sound in body and in mind.

It is, indeed, a great problem in civilization to establish a firm foundation for the sound development of women—to find proper training and suitable guidance by which health may be preserved and strength acquired.

Our natures exhibit a unity of body and soul ; and a full and complete development, in which perfect harmony exists, can be found in maturity, only when both body and mind have been fairly developed by suitable and intelligent training through childhood and youth.

We appreciate highly mental culture, but do little comparatively in the way of body development, especially in the upper walks of life, or if it is attempted, little or no system is used.

All people engaged in mental and sedentary work—scholars, tradesmen, clerks, professional men—all suffer from a one-sided development, caused by the lack of such bodily exercises as excite to activity the organs of respiration and circulation. But much as men suffer from these conditions of life, they suffer far less than do women and girls.

Custom allows boys to engage in energetic play ; and later in life, gymnasiums give ample opportunity to city boys for further exercise. Walking, rowing, swimming, base ball—all these are at their command.

Not so with girls and women. The girls are constantly restricted in their freedom even in play. To run, to shout, to jump is considered rude and uncouth.

As the girls grow older, the opportunities for physical exercise are as nothing. Their walks are short, their movement, because of fashion and dress, are constrained—and one might say that dancing is the only exercise allowed them. But again, here also the benefit that might be acquired is lost through the unsuitable dress, the dust, the heat, the vitiated atmosphere, and also by the too frequent over-amount of the exercise. Few gymnasiums for women exist even in our larger cities, and such as they are, the opportunities they afford are not taken advantage of, on account of the inherited prejudice in society against physical training of girls.

To make matters worse, to the regular mental work in the school are added the requirements of society upon the girl, — music, languages, together with domestic duties of all kinds.

Hysteria, and the thousand morbid physical conditions so common among women, would become far more rare, were women trained to physical exercise; and in their stead, we should see the fresh, rosy complexions, the firm, upright bearing, the graceful free movements we so much admire. Then, too, the children of these women would come into the world healthier, firmer, sturdier both in body and in mind.

One reason for the prejudice existing in the public mind against physical culture for women is that many suppose that the exercises would be the same used in men's gymnasiums, and that they must be performed with the same force and to the same extent. This is a great mistake. To transfer to a girls' gymnasium the same exercises that are in use in a boys' gymnasium would be unwise indeed. The fact that the bony structure of a woman is less firm than that of a man, the muscles less powerfully built, would, to an intelligent instructor, be reason for lighter exercises, and those, too, done less violently. Moreover, the considerations of sex and of fitness demand the exclusion of many exercises.

It cannot, however, be denied that a well-regulated course of gymnastics has a great advantage over various other exercises so often recommended to women for establishing and improving the health.

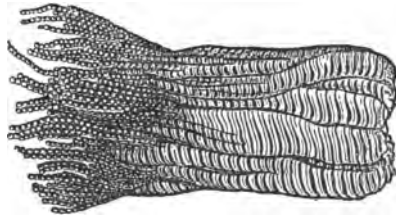
Long walks, climbing mountains, swimming exercises are, no doubt, of great benefit; but these exercises are seldom wisely or regularly or systematically carried out. Their effect, moreover, cannot be accurately estimated; while with gymnastics the practice can be regularly carried on in the house, at regular intervals, and in prescribed amount. Because of the stimulating results from practise in company with others, the school or club-room presents peculiar advantages and opportunities for this work.

There being few, or no opportunities, for the children not in schools, and for women to practise with agreeable companions and under select conditions, a course of gymnastics if judiciously arranged in their own home will be found of great advantage.

EFFECTS OF PHYSICAL EXERCISES.

The skeleton, as a whole, forms for our bodily structure a support and foundation; in the skull and chest and pelvis, the bones are so arranged as to form a protection for the soft parts enclosed. Moreover, the bones serve as levers for the attachment of muscles, by means of which movement is effected.

Upon these bones, and attached to them, lie the muscles, a mass of flesh, more or less thick. These muscles are made up of fibres, round or flat, and these are arranged in bundles. (See illustration.) The ends of the muscles are bound to the bones; and through the power of contractility imparted to the muscle by its nerve supply, is produced movement.



Muscular Fibre highly magnified.

This movement is seen in two different kinds of muscular structure; one kind is under the control of the will, and the muscle is called "voluntary;" the other kind acts for the most part independently of the will, and this muscle is called "involuntary." The muscles which clothe the trunk and limbs are of the voluntary kind; those of the internal structures, as for example, the heart, are examples of the involuntary kind.

It is with the voluntary muscles that we have chiefly to deal. These muscles are very numerous and have many purposes to perform, but as they are arranged and act together in certain well-defined groups, it is not necessary to study their individual action.

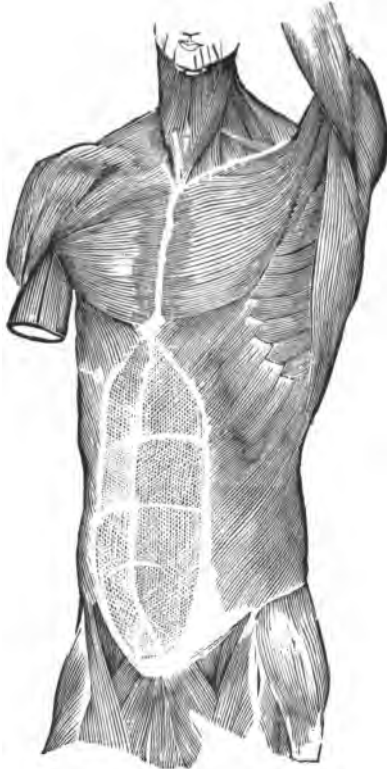


DIAGRAM OF FLEXOR MUSCLES,

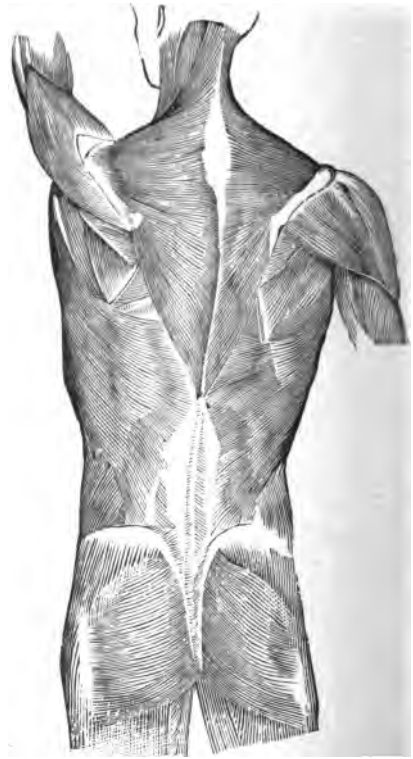


DIAGRAM OF EXTENSOR MUSCLES,

Diagrams of the *flexor* or doubling-up muscles, and the *extensor* or straightening muscles, which lie immediately under the skin, and which are chiefly concerned in moving the limbs on the trunk, or sustaining the body in the erect position.

The first and most important grouping of the muscles of the body is into two sets — the “flexors” and the “extensors.” (See illustrations.) When the body is standing upright, the arms hanging by the sides and the palms of the hands turned forwards, the whole of the muscles on the front of the trunk and limbs (except those of the leg below the knee, which are in the reverse order) are *flexor* or bending muscles, and those on the back of the trunk and limbs are the *extensor* or straightening muscles. These

two sets of muscles are antagonistic or opposed to each other in their action. There is, however, a remarkable difference between them which is of fundamental importance, namely, that the *flexor* muscles—those placed on the front of the body—possess a higher “tone,” that is to say, they are more on the stretch, and act more promptly and powerfully than the *extensor* or back muscles. This is shown in the tendency of the body and limbs to double or coil up, as we see in children when at rest or asleep. The arms and legs are folded up in front of the body, and the back and neck rounded or doubled up to shorten and relieve the greater tension of the *flexors* at the expense of the *extensors*, which are consequently lengthened and put more on the stretch. The stooping position of feeble persons and those who follow sedentary occupations, and the crouching attitude of persons who are growing old, are also due to the loss of balance between the two sets of muscles.

Beside the function of holding the body erect, and indeed as part of that function, the muscles have a duty to perform which is common to both the *flexors* and *extensors*. They have to surround and strengthen the joints either by their fleshy bodies or fibrous tendons, as well as to bend the joints and move the body from place to place.

The ligaments which bind two bones together are hardly strong enough to keep the two ends of bones forming joints in position; hence dislocations and deformities occur when the muscles surrounding the joints are weak and deficient in tone. In this way we have round shoulders, knock-knee, weak ankles, and flat-foot; the deformities occurring chiefly in the lower limbs, because they have the weight of the whole body to support. We should, therefore, always pay attention to the strengthening of the muscles of the joints, at the same time bearing in mind that weakness will first show itself in the failure of the *extensor* or straightening muscles.

The office of the blood is to nourish all parts of all structures of the body. It flows in tubes,—arteries and veins,—the heart serving as a

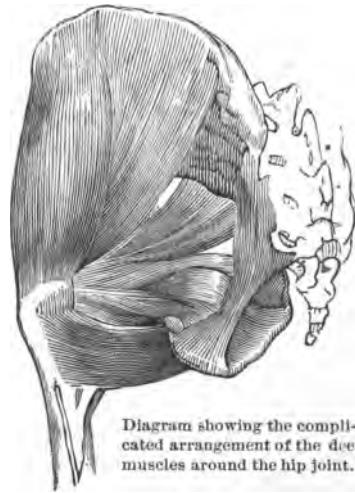


Diagram showing the complicated arrangement of the deep muscles around the hip joint.

force-pump to drive the blood to every part of the body. (See diagram.)

From the heart, the arteries branch in all directions to the individual organs of the body, branching and rebranching until they end in the fine capillaries, through the thin walls of which ooze the nourishing constituents thus reaching the surrounding tissues. In exchange for this nourishment, the capillaries receive from the tissues those liquid constituents which through chemical action have been changed and worn out by use—that is, have lost their oxygen and have become poisonous with carbonic gas.

This changed blood flows back through the veins to the heart, thence to the lungs, where through expiration the load of carbonic gas is thrown out; and through inspiration pure oxygen from the fresh air is taken in. The blood, now purified, goes to the heart again, thence out through the arteries over the body, to carry its life-sustaining element to the tissues of the body. It is therefore through the activity of the lungs—the respiration—that the blood is constantly purified and renewed.



DIAGRAM OF CIRCULATION.

The nutritive ingredients of the blood in the shape of albumen, fibrin, fat, and salt, are the materials from which the tissues of the body are built. But these materials when taken into the tissues become changed and are in constant need of repair. This repair of the blood constituents is, however, provided for by the digestive apparatus, the function of which is to so transform nutritive materials introduced from without, that they may become like the constituents of the body, thus assimilating and becoming part of the body itself.

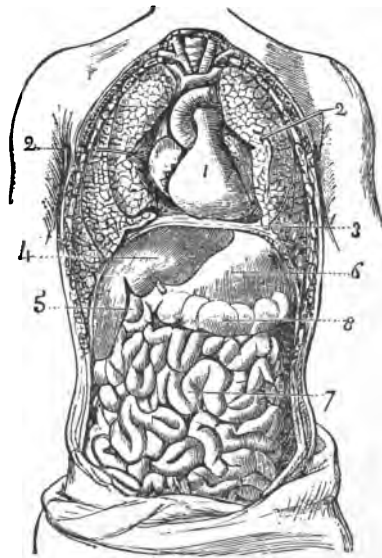
The Digestive Organs include the mouth, the palate, the tonsils, the tongue, the salivary glands, the teeth, the pharynx, the œsophagus, the stomach, the small intestine, the large intestine, the pancreas, the liver, and the spleen. The canal formed by the mouth, pharynx, œsophagus, stomach, and intestines, is called the alimentary canal.

The œsophagus extends from the mouth, through the neck and thoracic cavity to the stomach. The stomach is situated in the upper part of the abdominal cavity towards the left side. Opposite it, on the right side, lies the liver. The intestinal canal, consisting of the large intestine and the small intestine, joins the stomach and fills the greater part of the abdominal cavity. The digestion of food begins in the mouth, where, by the action of the *saliva*, the starchy matter is dissolved.

The chief work of digestion, however, devolves on the stomach and intestines.

In the stomach, the albuminous portions of the food are acted upon by the *gastric juice*. The material undergoing digestion then passes into the small intestines, in which, principally by the mixture of the bile which is secreted by the liver, the fatty matter contained in the food is digested. This dissolved mass of food is finally acted upon by lymphatic vessels found in the walls of the small intestine, and is through them carried into the arterial circulation — thus furnishing new supply of nutrition to the exhausted blood.

Such parts of the food as are not nutritious, not digestible, are now forced on into the large intestine by means of a peristaltic movement of the intestinal walls to be finally ejected from the body. By activity, is every organ rendered more powerful in the performance of its function. The more



1. Heart, 2. Lungs, 3. Diaphragm, 4. Liver, 5. Gall Duct, 6. Stomach, 7. Small Intestines, 8. Large Intestines.

an organ works the quicker are the materials at hand consumed, and the quicker the necessary repair and rebuilding effected — the latter, however, only on condition that the nourishment and respiration provide for it new material suitable in quality and in quantity.

By this accelerated and increased expenditure and income, the working power of the organ develops most favorably.

Now, if every muscle of the body receives a due amount of exercise, regular and methodical, then it must follow that each muscle must show greater strength, vigor, and power of endurance. In addition to this, the movements of each muscle will be under better control, the combined activity of several muscles for our common movement consequently is more complete, the capacity for co-ordinative movement greater, and the power of maintaining an erect, firm bearing be brought about.

Then, too, when we consider how large a part of the whole mass of the body is muscle, and that the action of this large part would demand a large and frequent supply of nourishment through accelerated circulation and respiration, we see at once that digestion would necessarily be stimulated and a general advantageous effect be produced on the whole body.

We all know from experience that after vigorous exercise the heart beats more rapidly and with greater force ; the breathing becomes deeper and more frequent, the cheeks flush, the animal heat is increased and a good wholesome appetite follows.

Then if proper nourishment is taken, the food is consumed by these invigorated organs in due proportion, and it must be that the health of the whole organism is improved, and the blood enriched, torpidity in the system producing constipation and hemorrhoids removed, and a general vigorous condition set up.

All functions of the body are stimulated and controlled by the nervous system. This is, at the same time, the means by which the action of the mind manifests itself. The nervous system comprises the central portions, namely, the brain, lying in the cavity of the skull ; the spinal cord, situated in the canal of the vertebral column ; and also the peripheral portion — that is, those branch-like ramifications throughout the body.

The brain and spinal marrow are the source of all activity in any part of the organism—the nerve being only conductors.

The Sensery nerves are those which, receiving with the aid of the organs of sense impressions from the external world, convey them to the brain; by sensery nerves we mean the nerves of sight, of taste, of hearing, of feeling, of smell.

The motor nerves are those which, receiving their impressions from the brain, conduct them to those organs or muscles with which they are in communication, and thus bring about activity in those organs or muscles.

Now, if regular exercise of the muscles can promote a healthy condition in the whole organism, then it is clear that the nervous system also, which controls and regulates the organism must, by reaction, be favorably influenced; for the nervous system, like other systems of the body, performs its work and renews itself according to the condition of the organism as a whole, of which it is itself a part.

Another beneficial condition brought about by regular exercise is that of deep untroubled sleep; and sleep, we must know, is necessary indeed to both physical and mental life.

The motor nerves, which by their impulses cause the contraction of the muscles, are directly benefited as regards their functional capacity by exercise of the muscles. Moreover, any improvement in one part of the nervous system has indirectly a favorable effect upon the remaining portions, so that the influence on the motor nerves of the muscles is of advantage to the sensery nervous system, and thus nervous irritability may be greatly lessened or wholly dispelled.

A healthy nervous system is the best foundation for the growth and development of a normal, mental and spiritual life. On the other hand, a



DIAGRAM OF BRAIN AND SPINAL CORD.

diseased and disordered nervous system is the ever fertile soil for mental irritability and unrest. Now, since regular physical exercise produces conditions favorable to the development of a sound nervous system, it has also a general advantageous effect upon mind and soul, imbuing them with life and vigor, rendering them normally sensitive, and destroying the tendency to mental irritability and hysteria.

Add to all this the fact, that valuable mental qualities, those salutary and refining in their influences upon human nature, are brought out as the direct result of regular systematic physical exercise, and we cannot overestimate the value of this line of training. For illustration: energy and perseverance of the will, which comes into play in the contraction of the muscles are readily transferred to other activities where will-power is required, and so may in the end come to be a part of the individual's character. Another illustration,—the habit of thinking quickly, as in “changes” and “command,” of concentrating the mind, as in complex exercises in which many muscles are brought into play, cannot fail to be acquired in exercises of this nature.

RULES FOR PRACTICE.

Exercises in gymnastics, to do any good, must be practiced with regularity and with moderation. Young children, and feeble persons, should not practice more than a half hour at a time,—perhaps twice a day. In cases of excitable temperaments, and for persons of sedentary habits, it is better to practice only a little at a time, several times a day.

The exercises, however, should be faithfully carried out for a long time; and, to some extent, through life. Only by such long-continued and regular practice can the full and far-reaching effects of gymnastic exercises be properly manifested. Whoever expects grand results to be forthcoming after a few weeks of irregular, impatient exercise, will be doomed to disappointment. It should also be borne in mind that violent exercising should be omitted in any conditions of inflammation, during pregnancy, and during menstruation.

The individual movements given in the book should be executed with

attention, force of will, and energy ; but calmly and without haste. Moreover, there should be a regularity in the number of repetitions., as well as in the arrangement of the movements—the repetition being, of course, based upon the strength of the performer.

At the end of each set of movements let there be a short pause, during which the performer should breathe slowly and deeply. This deep, regular inspiration and expiration is of great importance in all exercise. Any quickening of the heart produced by an exercise should be subdued before beginning another series of movements. As the result of any exercise, a wholesome but moderate fatigue should be felt. Never let this, however, develop into weariness or complete exhaustion.

Begin each exercise with moderate exertion, gradually increasing in vigor, then gradually moderating again.

As to increase in the severity of the movements, too much caution cannot be employed, especially in the case of weak people. Go slow, is a good motto. Let this rule also be observed : Older people require slower, stronger, more tense exercises ; while children require lighter, quicker and more vigorous movements.

If any exercise be followed by dizziness, pain in the chest or groin, or backache, let the exercises be discontinued, and the advice of a physician be sought. Small pains, such as may be felt in the muscles, are of no consequence and demand little attention. If however, even these pains should persist after prolonged exercise, let the work be divided, as advised above, and performed at intervals through the day.

The digestive organs should be empty as far as possible, if the greatest benefit from exercise is to be gained ; therefore the time before meals is the best time to use for gymnastic work. There should, however, be an interval between the exercise and the meal following, in order that the excitement arising from the activity may disappear, and the whole organism return to its normal condition. If a person is troubled with sleeplessness, exercise late in the evening is good. In evening exercises, however, the movements should not be very vigorous, and there should be a still longer rest before retiring.

If the conditions permit, it is of great advantage to practice in the

open air. Respiration in fresh air, stimulated by exercise, has a very beneficial effect upon the health.

In bad weather, especially in sharp north and east winds, or when a convenient place out of doors is not attainable, all exercise should be in a well-ventilated room, free from dust, and neither smoky nor damp.

The windows of the room should be left open during the exercise, even in cold weather, due attention being paid to the avoidance of draughts.

As to dress, it should be comfortable, and should interfere with no movements of the body. Any restriction, especially at the neck, chest, or abdomen, has injurious effect. Especially objectionable are corsets, skirts binding the hips, and tight, unelastic garters.

HOME CALISTHENICS.



At the beginning of the exercises the first ground or floor position is taken. The exercises are given in this position when no other positions are mentioned separately in advance.

In the first ground or floor position the heels touch (Fig. 1), the toes are turned out so far that the feet make almost a right angle; the legs are straight, body and head erect, the shoulders thrown back a little. The arms hang motionless at the side, the fingers are lightly curved and closed together, the thumbs in front.

In the second or closed position, the feet are turned upon the heels so far inward or together, by lightly lifting the toes, that the inner-sides of the feet touch. (See Fig. 3.)

When one foot is placed forward, obliquely forward, sideways, obliquely backward, or backward, the position so taken is called the third position. (See Fig. 31.)

For the support and improvement of the posture, it is well in many exercises to rest the hands upon the hips or to cross the arms behind the back.

With the palms of the hands upon the hips, the thumbs back, the fingers closed together are turned to the front. The hollow of the hand is completely at rest, the elbow is in an oblique line from the shoulder. (See Fig. 1.)

I. HEAD MOVEMENTS. (Neck Exercises.)

In folding the arms, the lower arms cross each other, rest upon the back, and the hands grasp the upper arms (Fig. 2), or the lower arms near the elbow joint.

All head movements are made gently and uniformly, not vigorously.

1. TURNING THE HEAD.

The feet take the *first*, ground or floor position, the hands rest upon the hips, or the arms are crossed behind the back. The head, kept upright, is turned gradually and uniformly as far as possible, and, indeed, so far that one looks first over the left and then over the right shoulder.

Every bend of the head and every sympathetic movement of the shoulders is to be avoided.

2. BENDING THE HEAD FORWARD AND BACKWARD.

The feet in the *first* position, the hands resting upon the hips. The head, without any turning, is bent with a gentle, continuous movement (not a vigorous movement), so far forward that the chin easily touches the breast.

After remaining in this position a short time, the head is brought upright by a slow, tense movement.

The backward bending of the head is done in the same way. The upper parts of the body, especially the shoulders, are to be held still so that they may take no part in the movement.



FIG. 1.

3. BENDING THE HEAD SIDEWAYS.

The feet in the *first* position, the arms crossed behind the back. From the upright position the head is bent carefully to the left (right) side. (Fig. 2.) A turning of the head, a bending of it forward or backward, as also a rising or falling of the shoulders must not be allowed.



FIG. 2-

4. CIRCLE MOVEMENTS OF THE HEAD.

The feet in the *first* position, the hands resting upon the hips. The head is bent forward, and then, without straightening it, is turned to the left side by a gentle, uniform movement, then backward, then to the right side (or in the reversed order), then forward, etc. The face retains its front position during this exercise.

The head movements are of great benefit in lameness and weakness of the throat and neck muscles. They are, therefore, to be practiced for faulty, habitually-weak head poise, especially for slanting position of the head. In the latter case, the exercises for turning the head should be taken on only one side of the head, the side opposite the slant. The head movements are also beneficial for stiffness of the turning-joints of the neck.

II. BODY EXERCISES.

All the body exercises are slow, taken in uniform movements.

5. TURNING THE BODY.

The feet in the *second* or closed position, the hands resting upon the hips or the arms stretched out in a horizontal position. (Fig. 3.) The upper part of the body is turned as far as possible to the left and right alternately; the head follows the movement, yet without

separately turning itself. The feet remain firm, and with the whole soles upon the floor; the legs remain straight.

6. BENDING THE BODY BACKWARD AND FORWARD.

The feet in the *first* position, with the hands resting upon the hips. With the legs perfectly straight, the head is bent forward, then the body, with a gentle, uniform movement, bends itself in the same direction, so that in this way the whole vertebral column partakes in the movement, and an angle is made at the hip-joint. Then reverse the movement, see Figs. 4 and 5. The shoulders must not be wrenched, and the backward movement must not be protracted too long. The position shown in Fig. 5 must not be held long; and persons who suffer from a rush of blood to the head must not remain long in the position shown in Fig. 4.



FIG. 3.



FIG. 4.



FIG. 5.

The straightening of the body must be gradual. Inhale deeply while bending backward and exhale while straightening the body; *vice versa*, exhale while bending forward and inhale while straightening the body.

7. BENDING THE BODY SIDEWAYS.

The feet in the first position ; both hands rest upon the hips, or the arm, which corresponds to the direction of the bending movement, hangs down at the side of the body. (Fig. 6.) The head is bent to the side and then follows the body in its movement as far as possible without raising the foot opposite the direction of the bending movement.



FIG. 6.

The head must not be turned, and the shoulders and hips must not be wrested from their positions.

8. CIRCLING MOVEMENTS OF THE BODY.

The feet in the *first* position, the hands resting upon the hips. The body is bent forward and then, without straightening the body, it is bent to the right side with a gentle movement, then backward, then to the left side (or in the reversed order), then forward, etc. The legs must remain straight during the exercise.

The upper part of the body in this exercise thus describes the form of a cone whose point lies in the lower end of the vertebral column.

Immediately after the close of the exercise, the body is brought to its upright position. No turning of the body must be allowed during its circling movement.

These body-exercises incite to greater activity the abdominal organs, and are especially helpful when these organs are sluggish as in cases of constipation. In such cases these circling movements of the body will be found of especial benefit. They can even induce, in cases of constipation, immediate results if the circling movements (and the force which they exert upon the bowels and their contents) follow always the same direction, namely : forward, to the right, backward, to the left, etc. (that is, corresponding to the course of the large intestines). The changing from the front to the right, and from the back to the left, must be done vigorously.

The backward bending of the body is also used to advantage for weakness of the muscles of the back and the consequent stooping over of the body. The bending of the body sideways is helpful for lateral curvatures of the spine.

The bending should be performed by the opposite side from that towards which the curvature bends.

III. EXERCISES FOR THE ARM AND HAND.

9. RAISING THE SHOULDERS.

The shoulders are slowly, but vigorously, raised as high as possible, and slowly lowered.

This may be done either with both shoulders at the same time, or with the left and right alternately.

Inhale while raising, and exhale while lowering the shoulders.

In the case of a so-called high shoulder, which is caused by a lameness of one side or a lateral weakness of the backbone, the exercise may be performed only on one side, that is by the lower shoulder.

10. FORWARD AND BACKWARD MOVEMENTS OF THE SHOULDERS.

The hands resting upon the hips. Both shoulders are first inclined uniformly forward, and then slowly, but vigorously, drawn backward. The elbows are, together with the shoulders, brought as far as possible to the front, and then to the back.

The upper part of the body and the head must retain their upright position during this exercise.

The backward movement is the more important part of the exercise. Inhale with this movement, and exhale with the forward movement.

11. SIDE RAISING OF THE ARM.

The arms, perfectly straight, are raised sideways, in a line with the body, with a gentle, uniform movement, to the horizontal position *a*. The fingers are kept straight and close together, the palms of the hands face inward when the arm hangs down at the side, and face down in the horizontal position of the arm. (Fig. 7, *a*, *b*.)

Then the arm is slowly lowered to the body, the muscles being kept tense; or the arm may be raised to the perpendicular position, *b*. In these exercises, the arms are to be kept straight, the palms of the hands facing outward when at *c*, *d*. Then lower as before slowly to the side.



FIG. 7.

Inhale deeply while raising, exhale while lowering the arms.

12. SIDE SWINGING OF THE ARMS.

- a*. To the horizontal.
- b*. To the perpendicular position.

This is the same as Exercise 11, only the movements are to be made vigorously and quickly. The arms should remain a moment in the horizontal and perpendicular positions, before bringing them down to the side.

Gentle, uniform breathing.

13. FORWARD RAISING OF THE ARM.

The arms, straight, are slowly and uniformly raised forward to the horizontal, or to the perpendicular position, and then lowered. The hands remain separate the width of the body from each other, the palms turned toward each other.

Inhale deeply while raising, exhale while lowering the arms.

14. FORWARD SWINGING OF THE ARM.

Like Exercise 13, only the movements are made vigorously.

Gentle, uniform breathing.

15. BACKWARD SWINGING OF THE ARM.

In order to make this exercise more effective the hands should be clenched. The straightened arms are then raised forward to the horizontal position, and swung vigorously backward as far as possible without bending the body forward. (Fig. 8.)

16. SPREADING OUT THE ARMS.

The arms are raised to the horizontal position in front. Then swing outward and backward, and then forward again, even to the touching of the hands, or to the crossing of the straightened arms. The arms must not be lowered in this exercise, but be kept in a horizontal plane.

This movement should be performed gently by persons with weak chests, and vigorously by strong persons.

Inhale deeply during the outward movements, exhale while moving the arm forward.



FIG. 8.



FIG. 9.

17. FUNNEL CIRCLING.

In the funnel circling, or the arm circling in smaller circles (Fig. 9.), the arms are raised sideways to the horizontal position, the hands being kept straight; with a slow or uniformly quick movement, describe circles, whose centres are in the upper part of the shoulder-joints; each hand would thus describe the form of a cone, whose apex is at the shoulder.

18. MILL MOVEMENT.

The mill-movement, or the arm circling in large circles is given:

- a.* with both arms together.
- b.* with one arm working backward and the other forward.
- c.* with one arm in advance of the other, so that when one is at *a* the other is at *b*. (Fig. 10.)

Let the movement be slow and steady, holding in mind the even revolutions of a large wheel.

Let the arms be stiff and straight, the hands flat and extended.



FIG. 10.

Vary this exercise, by changing the hands at *c*, as they move down and back, to a position with the palms up.

Hold the body erect and firm.

Inhale on raising, exhale in lowering the arms.

Because this movement lifts the whole chest wall, and so enlarges the whole chest cavity, it is a most excellent exercise for people with depressed, weak chests and round shoulders, for lax stooping positions, etc.

All arm-raising, arm-circling movements do much to remedy the defective, bony frame-work of the chest, as well as to strengthen the back and chest muscles.

19. BENDING AND STRAIGHTENING THE ARM.

Upper arms kept close to sides, being careful not to turn the elbows out; forearm flexed; hands clenched, and resting in front of the shoulder,—not on the chest, as in that position the shoulders are not thrown back in the least.



FIG. 11.

From this position, strike out strongly forward, upward, outward; alternate hands; both hands. (Fig. 11.)

Notice the position of the hands in Fig. 11. Let there be no swaying or jerking of the body. Knees and trunk firm.

Vary exercise by leading with one arm, the other remaining in the flexed position till the first returns to its position on

the chest. Thus, exercise of the will and the power of co-ordination is added to the simple movement.

20. ARM-STRAIGHTENING DOWNWARD.

Fold the hands, palms upwards as in Fig. 12.

Body and head firm and erect.

Slowly and vigorously straighten the arms downward, drawing the shoulders down and back.

Inhale in position of Fig. 12.

Exhale slowly as the arms straighten. No greater

proof of the usefulness of this simple movement is needed than the irresistible desire to yawn that accompanies the exercise when performed slowly and with force.



FIG. 13.



FIG. 12.

21. ARM THRUSTS.

Extend arms at shoulder level, elbows a little back, the hands clenched. Be careful that the shoulders *do not* rise.

a. Bring hands together across the chest, and return to position. (Fig. 14.)

b. Carry arms forward and return, keeping the arms stiff and the palms down.

c. Carry the arm straight up overhead, striking the thumbs together, palms, of course, forward.

Combine these motions as in the mill-movement and those following.



FIG. 14.

22. HAND-RUBBING.

Raise the arms, extended with palms down, to the shoulder level. To quick music, violently rub the back of one hand with the palm of the other. Change hands. Continue till a genuine glow of warmth is felt



FIG. A.



FIG. B.

23. PERCUSSING THE FOREARM.

Raise arms forward as in 22. Quickly percuss the arm from shoulder to wrist. Change arms. Rest.



FIG. 15.

Add to these, back, side, and chest percussion, as suggested in Figs. A. and B. and there will be an undeniable sensation of warmth in the body of the one percussed.

24. For a *light, quick* movement, this simple exercise, indicated in Fig. 15 is excellent. Vary it by combining double and alternate movements, outward, upward, obliquely outward forward, and obliquely backward.

Accompany the outward movements with corresponding movements of the head.

25. Raise the arms to shoulder level, extended in the front. Hands clutched, palms up. Extend and flex the forearms vigorously, striking the chest. Vary and combine the movements.

All these exercises, as will be evident in the performing of them, bring into action the back, chest, and arm muscles, produce more rapid breathing and consequently more rapid combustion and change of matter, producing a sensation of warmth and vigor throughout the body. The blood is drawn away from the head to the extremities, circulation is given fresh impetus and, if not foolishly carried on to the point of exhaustion, these simple exercises alone would do much to overcome the ill-humor, the indifference, the general mental and physical lassitude of those cold-blooded, shivering people who are "not ill and yet are not well."

26 HAND EXERCISES.

Extend arms at side, with the dumb-bells preferred ; (Fig. 16.) Vigorously, move the wrist up, down, forward, back.

Same exercise, hands at sides of the thighs, the arms hanging.

Same exercise over head striking one end then the other of the bells. Let this twisting be done as much as possible with the wrist alone.

27. With arms extended at sides as in Fig. 16, circle the wrist and bell. Circle backward. Circle forward.

In this the hand describes a cone, whose base is the circle and whose apex is the wrist.



FIG 16.

28. Rapidly clench and extend the fingers. Spread apart and close the fingers. Work the fingers in exaggeration, — as if playing upon a flute.

LEG AND FOOT EXERCISES.

29. In these it will be found difficult to maintain the equilibrium of the body. This must be acquired, however, or the movements become exceedingly awkward, and are worse than useless for physical improvement.

For assistance, let one hand rest lightly upon a table or chair. Or let two perform together, thus aiding in the support of one another.

30. LEG-RAISING EXERCISE.

The foot is advanced from the first position. (Fig. 17.)

- a. Forward and back.
- b. Obliquely forward and back.
- c. Sidewise.

In this exercise, the leg upon which the body poises should be kept firm and straight; the toes pointed downward and outward; the body firmly perpendicular. Any bending of the firm leg and swaying of the body converts an exceedingly graceful movement into an exceedingly awkward one.

Advance the leg — 4 counts. Hold it in position — 4 counts. Bring it back to the floor — 4 counts.

31. LEG-STRETCHING.

The leg-stretching exercise differs from the leg-raising exercise only in this — that the forward and backward movements are done vigorously. Great care will need to be taken in this vigorous exercise that the body be kept firm and the balance preserved.



FIG. 17.

32. SWINGING OF THE LEG.

In all these exercises, when the performer stands alone, the position should be with the hands on the hips, the thumbs back, the body firm, the head up.

Swing the leg backward and forward to moderate height, 1, 2, 1, 2, 1, 2, 1, 2.

Toes pointed downward and outward; in order to avoid dragging, the leg is raised slightly.

33. LEG CIRCLING.

Stand firmly, hands on hips. Raise leg forward to moderate height, bringing the foot outward, describing a circle.

Raise leg backward, describing a circle.

Raise leg outward, describing a circle.

It is well to hold one's balance by grasping the back of a chair with the hand opposite from the side in exercise.

34. LEG TURNING.

Stand with feet at right angles. Turn feet inward till the inner sides touch, the feet being now close together.

Turn the feet outward as far as possible.

Count 1, 2, 1, 2, 1, 2.

35. KNEE BENDING.

Knees bent, heels raised. (Fig. 18.) Lower the body only so far as to make with the upper and lower leg, a right angle. Remain in position of crouching, 4 counts; stand erect while partner makes same movement; or if alone, stand erect, 4 counts.

The same movement may be performed quickly, that is, 2-4 time, with no pause.

36. ALTERNATE KNEE BENDING.

Take the advance step position, a foot or a foot-and-a-half obliquely forward to the right, then to the left.



FIG. 18.



FIG. 19.

Opposite hand on hips or at side. The stationary leg firm, body upright. Now sink slightly upon the advance leg; advance the other foot, sink slightly. Repeat, one foot advancing, then the other. Count, "advance 1, sink 2, advance 1, sink 2, etc."

For variation, same movements, going directly sidewise. The same movement, obliquely backward, one foot, then the other, makes a very pretty preparatory exercise for "curtesying."

37. KNEE RAISING AND LEG STRAIGHTENING.

Body upright and firm, raise the bended knee to a right-angle with the body. (Fig. 20.)

Gently, yet vigorously, straighten the leg and ankle, the toes pointing outward. Four counts—raise, straighten, bend, down—1, 2, 3, 4.

38. RAISING THE LEG BACKWARD.

Stand in position, the hands on the hips. Slowly raise lower right leg backward to a right angle. Return foot to the floor; raise the other leg in the same manner. Keeping in mind what



FIG. 20.

was said in the introduction as to the anatomical arrangement of the

extensors and flexors, the force of the order in these simple exercises and their application is at once appreciated.

39. RISING UPON THE TOES.

Hands upon the hips or the arms folded behind. Rise very slowly and evenly upon the toes. A weight upon the head in this exercise aids greatly in maintaining an erect, firm position of the body. The weight should be very light lest there be a sense of restriction in the effort to keep the body firm. It is well to remember the difference between stiffness and firmness.



FIG. 21.

40. FOOT-BENDING.

Raise foot, toes pointed outward. Body firm, Flex and extend the foot—1, 2, 1, 2, 1, 2.

41. Foot raised as in 40. Turn toes outward and inward, 1, 2, 1, 2, 1, 2, etc.

42. Foot in same position, leg firm, circle with foot only.

These last exercises can be given while sitting. These exercises strengthen the muscles of the lower leg, and also free the joints. In this relation the spreading movements, the leg-swinging, and leg-circling, exercise the hip-joint; the knee-bending, knee-raising, the knee joint; and the foot-bending, foot-turning and foot-circling, the ankle joint.

All leg movements tend to bring down the "rush of blood to the head." The foot movements, therefore, are especially commended to those who suffer with cold feet.

Raising, swinging and circling the legs, and especially a vigorous raising of the knee, promotes the activity of the abdominal muscles and organs.

Bending the knee, raising the leg, and rising upon the toes, if done correctly with the head and body erect and firm, greatly strengthen the muscles of the back. They are, therefore, a valuable assistant in the attempt to gain a firm, graceful poise.

43. WALKING, RUNNING, HOPPING.

a. Raised foot, straight leg, throw weight forward, take a long step, *keeping the body firmly erect.*

Continue with alternating feet, being careful that the body does not sway from side to side. Don't spread the arms, don't point the elbows outward. However valuable strength may be, grace also has its value.

b. Step, and raise the knee vigorously as if going up stairs, the steps of which are rather high.

c. Stationary running, or advancing. This is a continuous hopping from one foot to the other on the balls of the feet. The knees bent, the body a little forward, the elbows bent and at the side of the body, the fists clenched.

Combine this with *a* and *b*, and a vigorous exercise, indeed, is produced.

d. Heels together, spring, raising the knees, and then straightening the legs as the body descends. Keep the heels together.

e. Same exercise in a crouching position. Don't let the weight of the body come down quickly or heavily upon the heels, so jarring the spine and head, a light spring is all that is necessary, and that, too, on the balls of the feet.

These exercises of walking, running and hopping drive the blood down from the head and chest, promote the circulation, and arouse the sluggish abdominal organs;—especially commendable in cases of constipation and its accompanying conditions.

They have also a generally invigorating effect, as will be quickly evidenced from the warmth, and necessity for quick, deep breathing felt. From this, according to the law of demand and supply of oxygen in the system, it is at once seen that a great change in the tissues is brought about.

Such exercises, performed for a very few minutes even, are a valuable substitute for long walks or mountain-climbing.

In these, as in all violent exercises, the condition of the person's heart should be taken into careful consideration.

COMPOUND EXERCISES.

44. Bend the head back, at the same time carry the outstretched arms backward as far as possible, inhaling slowly and deeply.

Bring the head back into erect position, at the same time dropping the arms down to the sides, exhaling slowly and evenly.

This exercise strengthens the neck, and the dorsal muscles, and invigorates the respiration. Especially useful in cases of stooping and feeble carriage as well as for all conditions of imperfect breathing.

45. Bend the body forward, let the arms hang dead from the shoulders. Swing them vigorously backward and forward, the body being raised to its erect position as the arms swing forward, and bent as the arms swing backward.

This vigorous exercise has a generally stimulating effect upon the circulation, but especially does it act upon the sluggish abdominal organs.

46. Bend body to the right, letting the left arm drop dead towards the right side. Swing the arms right and left.

Change position to the left — swing arms.

This exercise is a valuable adjunct to exercise 45.

For curvatures of the spine this exercise, performed only on the side opposite the curvature, is a great help.

47. Carry the arms forward to a horizontal position. Twist body and swing arms right and left, letting the elbows bend freely and the hands strike upon the chest — one and then the other.

With these, combine leg swinging, raising or circling, so making variety and increased energy in the exercise.

In these compound, co-ordinating exercises, the training of the will, and its effect in producing a firm carriage, is a factor never to be lost sight of.

WAND EXERCISES.

For the following exercises, any straight rod which is smooth and fairly strong will be all that is necessary. Broom handles, curtain sticks, etc.

POSITION.—Feet in position, the wand across the thighs, backs of hands forward, thumbs pointing downward. (Fig. 22 *a*.)

48. WAND RAISING.

a. Raise wand till the arms are on a level with shoulders.

Rest 1 count.

b. Raise wand over head.

Rest 1 count.

c. Lower to shoulder level.

Rest 1 count.

d. Drop to first position.

Inhale on raising the wand, exhale on lowering the wand.



FIG. 22.

d. Overhead.

Rest 1 count.

e. Horizontally in front as in 48.

Rest 1 count.

f. Drop to Attention position. (Fig. 22.)

Combine 48 and 49.

In all wand exercises, let the wand be perfectly horizontal.

49. *a*. From position (Fig. 22,) set wand on the shoulders, (Fig. 23.)

Rest 1 count.

b. Drop wand to position of Fig. 24.

Rest 1 count.

c. Raise to shoulders.

Rest 1 count.

50. Carry wand up over head—arms far apart. (Fig. 24 *a*.) Carry wand down, without bending the arms, (Fig. 24 *b*.) Carry wand back into first position. Count 1, rest, 2, rest, 3, rest, 4, rest. *Hold body firmly*, inhale on raising, exhale on lowering the wand.



FIG. 23.



FIG. 24.

51. SWAYING THE WAND.

From the horizontal position in front, (Fig. 22,) carry the wand up, perpendicular, at the right side. Rest 1 count.



FIG. 25.

Horizontal in front.

Rest one count.

Perpendicular at left side.

Rest one count.

Horizontal in front.

Rest one count, etc., etc.

Be careful in this exer-



FIG. 26.

cise that there is no sympathetic swaying of the body.

52. Wand horizontally across the front. (Fig. 22.)

Raise wand to the right, the left arm over the head. (Fig. 26.)

Rest 1 count.

Horizontally across the front.

Rest 1 count.

Raise wand to the left side, right arm over head.

Rest 1 count.

Horizontally across the front.

Rest 1 count. *Repeat.*

Inhale on raising, exhale on lowering the wand. Combine with these any simple foot movement, so taking advantage of every opportunity to educate the will.

Vary by bringing the wand down across the back (Fig. 27), after the movement of (Fig 26), then up



FIG. 27.



FIG. 28.



FIG. 29.

over head on the opposite side, then across the front, (Fig 22).

53. Raise arms and wand from the Attention position of Fig. 22 to the level of the shoulders.

Notice that the elbows do not droop, neither should they be above the level of the wand. Now thrust wand to the right, (Fig. 28), then to left, coming back to the position on the chest between each two thrusts.

54. Wand in position (Fig. 22). Raise to chest, elbows up and bent. Throw right end of wand over the head, the opposite elbow dropped, the accompanying arm extended. (Fig. 29.)

Repeat right and left.

55. Swing the wand right and left, from horizontal position in front, twisting also the body. (Fig. 30.)



FIG. 30.



FIG. 31.

Add to this a slight bending of the corresponding knee and a slight bowing forward of the body.

In this "mowing-movement" let there be quiet, regular breathing.

56. A simple exercise in which the chest is necessarily held erect and firm is from walking evenly and firmly with the wand in the position of (Fig. 31.)

Wand exercises strengthen the chest muscles, expand the chest cavity and promote the activity of the respiration in a marked degree. Especially to be recommended, are those in which the wand is carried over the shoulders. All wand exercises are to be practised therefore by those with weak, depressed chests, round shoulders, and with stooping habits arising from a general sense of weakness in the spine.

Raising and lowering the wand with one arm is excellent for spinal curvatures, the raising being performed on the concave side of the curvature, and the lowering on the convex side.

CHEST WEIGHTS.

A simple chest weight, one easily made, consists of two hollow wooden handles, through which a rope passes to weights attached at each end. (See illustration.)

These weights may be increased or diminished as required.

POSITION FOR EXERCISE, (Fig. 32.)

All exercises with this weight are to be performed slowly and regularly.



FIG. 32.

57. From position (Fig. 32,) extend arms forward and back into position. (Fig. 33.)

58. Same movement directly upward, then back into position.

59. Arms extended right, then left, then back in-



FIG. 33.

to position. (Fig. 34.)

60. Combine 57, 58 and 59, coming back to position between each two.



FIG. 34.

61. Both arms extended at same time. (Fig. 36.) Combine 57, 58, 59, 61.

62. Holding one arm bent, extend the other outward, upward, to the side, backward.



FIG. 35.

Try to keep the handles on the same level in movements on the same plane. (Fig. 34.)

63. Move one arm obliquely upward, the other obliquely downward and outward. (Fig. 35.)

Move one arm forward, other backward.

64. Move arms slowly forward as in Fig. 34.

Raise arms slowly and evenly to position of Fig. 37 a. Lower arms to position of Fig. 37 b.

Raise arms again.

Lower to arms length forward at shoulder level. (Fig. 34.)

Position of Fig. 33.

Repeat — 6 counts and 6 rests.

Inhale on raising, exhale on lowering the weight.

65. Move arms forward, then extend them at either side. (Fig. 36.) Position of Fig. 34 again. Overhead. Fig. 37 a. Lowered, (Fig. 37 b.)

Overhead. (Fig. 37 a.) In Front. (Fig. 34.)

At sides. (Fig. 36.) Position. (Fig. 33.)

Repeat slowly and evenly — 7 counts.
 Inhale on outward and upward movements.
 Exhale on inward and downward movements.



FIG. 36.



FIG. 37.

66. Move arms to position forward. Then upward. Now let arms rise and fall, (Fig. 37 *a* and 37 *b*,) inhaling as they are lowered and exhaling as they rise.

67. From Fig. 37 *a* lower arms till the rope lies across the shoulder blade. Alternate these with Fig. 36, 3 counts. Repeat.



FIG. 38.

68. Very slowly with swinging motion alternate Fig. 36 and Fig. 38, Fig. 37 *a* not intervening.

Exercises 66, 67 and 68 should not be performed one following the other, as the same muscles are used in each movement. Care should be taken also not to exercise too long. Continued exercise is likely to make shoulders ache.

With these chest exercises, foot movements can be nicely combined.

In the foregoing exercises with the chest weights the muscles of the chest and back are strengthened and also those of the arm, wrist, and hand.

II. — BAR EXERCISES.

The bar consists of a rod firmly held in place by means of slots in a frame to which it is fitted. (See illustration.)



FIG. 39.

The rod should be of strong wood, and should be well polished. One end, too, should be square (*b*) that there be no sliding or slip-

ping during the exercising. It is well, so the carpenters tell us, to soak the bar occasionally in linseed oil, thus adding to its strength.

69. The bar is hung so that the fingers can just reach it.

Now with a spring, catch the bar, palms forward, and swaying allow the body to hang freely. Keep the head erect, the back concave, the legs straight, the toes pointing downward and outward. (Fig. 39.)

Let the spring from the bar be light, the weight coming upon the toes and with the knees slightly bent.

If this rule in jumping were observed at all times, it would be well. Nothing is more awkward than the clumsy bouncing down upon the feet as too often seen in adults. Much of the spring and elasticity of childhood we must lose, but there is also much we can retain. In addition to the awkwardness of coming down squarely upon both feet in jumping, there is a terrible jar to the system and concussion along the spine, which often produce sad results indeed.

70. (a) Add to the free hanging, as in exercise 69, the slight relaxing of the hold with first one hand then the other.

b. Add a swaying movement, produced by gradually moving along the bar with the sliding along of the hands one after the other.

Right, then left. Keep the legs straight in this, that the body may fall as much as possible as a straight line. It will be almost impossible to do this exercise at first. Let another, by placing his hands upon the swinger's hips, give the swaying movement, and if possible even assist the lifting of the body a little as the grasp is relaxed in order to move the hand along the rod.

71. From position of Fig. 39, let the right hand then the left be gradually moved apart; then gradually bring them together again until they touch.

72. a. Spring upon the bar. Swing backward and forward, the legs extended, feet close together, toes pointing downward. In order to assist in the swinging, lift the feet, the legs still extended, by a flexing at the hip.

b. By moving the legs to one side then the other, in a similar manner, sway right and left. Take care here that the swinging is directly right and left. In this the right and left arms must bend a little to accommodate the motion.

73. Hang in position of Fig. 39. With a spring upwards in which the arms are bent and the grasp relaxed, move along so that the hand-grasp is each time a little farther towards the end of the rod. In this manner move along from one side of the door to the other.

74. Raise the bar. Spring and seize it with the hands. As the body settles down, spring again, the arms bending, of course, to accommodate the movement. Repeat several times. Help will, in all probability, be needed. Try to raise the body so as to look over the bar.

75. Exercise with the under-grasp on the bar.

Have the bar at first at the head level; as strength and confidence increase, raise it.

Spring and seize the bar with the under-grasp as in Fig. 40, lifting the body high enough to look over the bar.



Fig. 40.

Hold in this position, then *gradually* lower the body and spring to the floor.

76. Place the bar at shoulder-level. Stand at arms' length from the bar. Place hands on the bar, let weight fall backward, feet slide forward until the body hangs from the bar, as from the rings in Fig. 45.

In this position perform any of the given leg exercises.

77. Grasp bar with palms down. (Fig. 41:) Sway right and left, and hold the position of Fig. 41.

78. Seize bar (or table) facing the bar. Slowly and evenly rise and fall upon the bar, as in Figs. 42 and 43. At waist level.

79. Same exercise at chest level.

These exercises upon the bar bring into activity a great part of the muscles of the entire body, especially, perhaps, the chest muscles and those of the upper part of the back, the neck and the arms.

The swinging includes the hanging exercises and brings in, in addition, the exercise of the abdominal and lower dorsal muscles. No more marked result is seen than in the carriage; which, from these exercises faithfully performed, becomes strong and firm.

In curvatures of the spine, the swinging sidewise should be made to accord with the side needing strengthening or contracting.



Fig. 41.



Fig. 42.



Fig. 43.

EXERCISES WITH RINGS.

The rings should be about shoulders'-width apart. They should be arranged in supports so that they may be raised or lowered.

80. Grasp the rings so that the backs of the hands are outward.

Begin with the rings at head level. Later, let them be lowered.

Let the body gradually sink backwards; gradually raise the body to the erect position. (Fig. 45.)



Fig. 45.



Fig. 46.

81. Let body sink forward. Gradually raise it to the erect position. (Fig. 46.)

Add to these any bending, stretching, leg or knee-movements, holding the trunk firm and strong.



FIG. 47.

82. In the same gradual manner, swing to the right and to the left. (Fig. 47.) Keep the feet on the same place and as nearly as possible in the same position.

83. Keeping the feet in the same position, revolve, forming a cone of which the feet form the apex. Let the body hang freely and swing loosely. It will be necessary in swinging forward to raise the heels. (Fig. 48.)

84. HANGING OUT-STRETCHED,

The rings are at such a height that they can be reached only by a little spring. Seize the rings and hang extended as in Exercise 69.

85. Spring as on the bar in Exercise 79.

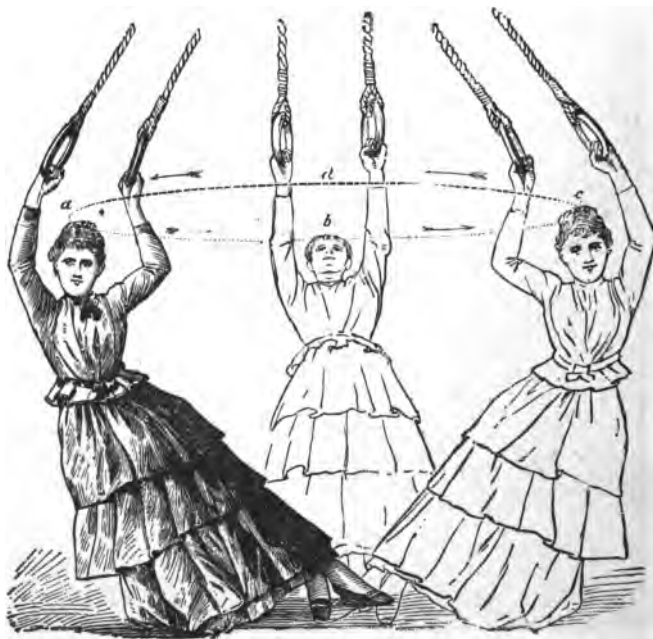


FIG. 48.

86. Seize the rings and turn them, bending the arms and lifting the body, (Fig. 49.)



FIG. 49.



FIG. 50.

87. Grasp the rings. Step back as far as possible. With a

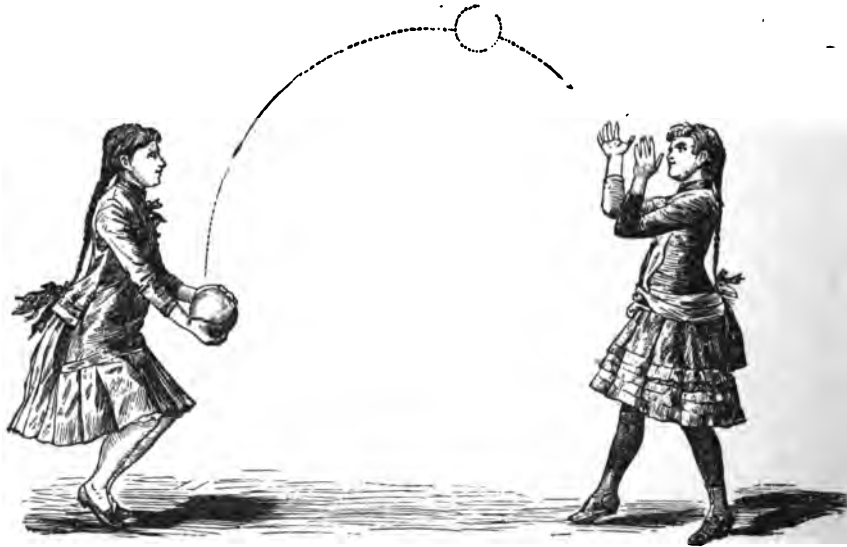


FIG. 51.

spring, lifting the feet forward, swing backward and forward.

These ring exercises in effect are like the bar exercises; and excepting the swinging and revolving exercises have no great advantage over the bar.

F.—BALL THROWING.



One hardly thinks how much physical exercise can be had from simple ball-playing.

SUGGESTIONS FOR EXERCISE.

Throw with one hand — *keeping the body firm!*

Toss the ball, heels raised, knees bent.

Throw ball backwards over head, holding it on the chest, elbows out at shoulder level.

With ball on chest, hands with palms forward, push the ball from the chest.

Catch with one hand, other hand on hip.

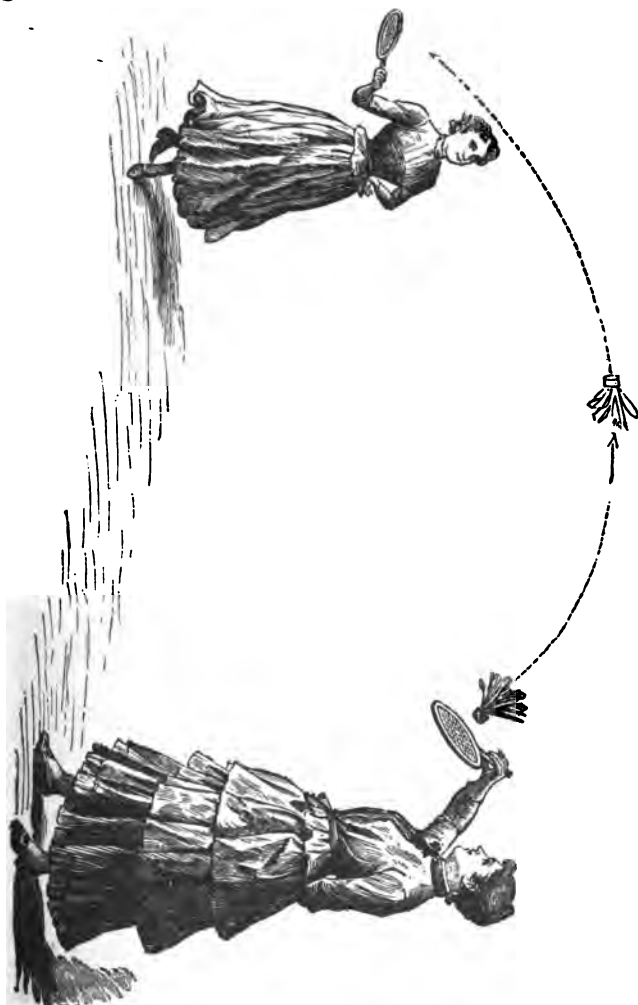
In all these exercises *keep both feet on the floor and the body firm!*

Sometimes for the sake of rapid stimulation the same exercises may be done with an extravagant amount of leg moving, jumping,

etc., though, as a usual thing, any movements suggesting lack of firm control and poise should be avoided.

BATTLEDORE AND SHUTTLE-COCK.

Too much can hardly be said in favor of a revival of this English game.



If played rightly it is not only an exciting game, simple as it seems, but it is of great value from the point of physical training.

One has but to play it to be convinced of its exercising value. Add to that the grace and freedom of movement acquired, if only the rules for position are observed, together with the intense interest aroused when the players become sufficiently skillful to keep in the air two shuttlecocks, and we have a game not too old for the children nor yet too young for the parents.

APPLICATION OF EXERCISES.

In cases of severe physical disturbances no person should attempt to rely on any general work on Gymnastics. The physician should be consulted, and his directions obeyed.

As illustrations of conditions in which there is in all probability no organic trouble, and where general gymnastic work, if performed regularly under the right conditions and with intelligent consideration, will be profitable, we submit the following :

1. GENERAL DEBILITY, RETARDED GROWTH, ANAEMIA, AND DEFECTIVE CHESTS.

In all anæmic conditions, those simple, light exercises which do not exhaust but which serve as a gentle stimulus, are to be relied upon. Good blood, we must remember, can be made only by proper nourishment—breathing in of pure oxygen. Any gentle stimulus, then, to the muscular activity by means of exercise whereby the change of matter improves respiration and a more normal condition of the nerve-life is brought about—such stimulus it is evident must produce an improvement in the general tone of the system.

(See classification of exercises at the end of the section).

In cases of *defective chests*, any exercises which tend to enlarge the chest cavity are to be used; as, shoulder-raising, shoulder-straightening, arm-raising and arm-swinging, arm-spreading and arm-circling, all wand exercises, chest-weight movements, and many others which will be referred to later.

In the correction of this particular defect, it must be borne in mind that only by regular persistent exercise, faithfully adhered to for long weeks, can any good result. The chest is not to be changed in any other than a slow, steady manner—by regular work, and that increased very gradually from week to week.

2. CONSTIPATION, HEMORRHOIDS, DYSMENORRHOEA.

Constipation, Hemorrhoids, and in many cases, Dysmenorrhœa, are due to a general sluggishness of the portal system. With these are often associated dizziness, headaches, difficult breathing, and palpitation of the heart, together with a nervous irritability, amounting sometimes even to melancholia.

In these cases, good strong energetic exercise is of untold value. We recommend, for example, the turning and bending and twisting of the body, arm-swinging and circling, leg-swinging, circling and raising, knee-raising as in the "stair-walk," running, hopping, etc., etc.

3. FAT.

In women, at the climacteric, who are in comfortable, easy circumstances, having little demand upon them for physical exertion, and living upon rich food, a tendency to an increased fat deposit is frequently found. With this come shortness of breath, rush of blood to the head, and palpitation of the heart.

It is unwise and unnecessary to let this condition go on until absolute discomfort appears, the heart-fibre itself begins to degenerate, and apoplexy or paralysis threaten.

A diet free from fats, cold baths, and vigorous exercise can prevent all this.

The same exercises, recommended for the sluggish condition of the portal system, are valuable here together with long walks. If dizziness, palpitation, and difficult breathing follow, then grade the exercising to the condition found. Many of these exercises done very slowly will produce equally good results without putting so severe a tax upon the respiration.

4. ASTHMA.

It is well in these cases to have the physician's diagnosis. For the asthma may be merely a nervous condition, or it may be due to some abnormal condition of the lungs, or to some heart disease.

In the former cases any exercise which shall act upon the respiratory muscles will be valuable; but if the trouble is due to the heart's condition, then it must be borne in mind that only mild, gentle exercises, such as do not unduly agitate that organ, should be used.

5. INCORRECT BEARING.—IRREGULAR DEVELOPMENT.

Under this, we are at once reminded of round-shoulders, curved-spines, the stooping habit, etc.

With round shoulders, the neck and head are pushed forward, and the chest cavity accordingly depressed and contracted.

For this faulty carriage such exercises should be used as will strengthen the muscles of the shoulders, contract them, and consequently draw the shoulders back into place—backward bending of the head and body, backward movements of the shoulders, raising and swinging the arms backward, funnel and mill-circling, exercising with the wand, hanging and lying backwards from the horizontal bar, and from the rings.

HEAD DRAWN TO ONE SIDE.—This may be the result of some curvature of the spine or from the undue contraction of the muscles of one side of the neck. Simple head exercises, *towards the side opposite the contraction* will do much to correct this.

"TOEING-IN."—Leg circling, the toes *always pointing downward and outward*, fancy steps, marching, walking, ankle-circling outward, etc., etc., are so evidently the exercises for this usually easily remedied fault, that we need say no more of it here.

LATERAL CURVATURE OF THE SPINE.—This is very common in

children, especially such as have been weakly from birth, and consequently susceptible while the bones were especially pliable, to the least unevenness in their development.

Lateral curvature shows itself in hitherto strong and erect children during the period of school-days, owing to the too often illy-arranged seats and desks, and the child's habit of leaning upon the left forearm and so twisting the spine and elevating the left shoulder.

In these cases an ounce of prevention is worth a pound of cure. But if the harm has been done, the following exercises will help to equalize the force of the muscles involved



FIG. 54.—SHOWING CURVATURE.

Free exercises — standing high upon the toes ; bending the knees ;



FIG. 55.

is on the concave side a few centimeters higher than the other end.

walking backwards, erect, with the wand ; raising and lowering the wand backwards ; arm and wand swinging, raising and lowering on the side opposite the curvature ; body turning and twisting ; hanging straight from the bar, swinging, having the end of the bar which is grasped by the hand which

With the rings, too, it is well for curvature, to have one ring a few centimeters higher than the other.

In this work more than in any other, perhaps, is the evil result of over-work more apparent. Often weeks of patient work is overturned by one hour of over-exertion.

CHOREA. — Nothing is better in this disease, commonly called "St. Vitas' Dance," than gymnastic exercises. Not only is better nerve-nourishment brought about by the exercise, but to a surprising extent, by regular movements with evenly accounted time, is the will assisted to regain its mastery over the muscles. Let all exercises under this diseased condition be done slowly, evenly, and with concentration of will.



We add here an illustration of the chest-weights generally used in gymnasiums. This, as shown, is firmly attached to the wall, and has two weights attached to two cords with handles. This chest weight has with it a chest expander. This is a simple arrangement by which the cords are carried to the ceiling, and brought through a pulley fastened over head. This simple addition is of great value in chest exercises especially for the raising of the whole chest wall and its consequent expansion.

Because women as a rule breathe with the chest only, and and that, too, with the upper part, these exercises are of special importance, as by them the respiratory action of the chest is increased, the diaphragm is forced into action, and full deep abdominal breathing becomes a necessity.

EXERCISES ON THE LADDER.

A surprising variety in exercise can be had from a simple ladder inclined against the wall.

Exercise.—I.

Advance the right hand and the right foot one round.

Advance the left hand and the right foot one round.

Advance the right hand and the right foot one round.

Keep the body erect, and the eyes directed to the round to be grasped.

Exercise. — II.

Same exercise, except that the hands grasp and slide along the sides of the ladder.



FIG- 57.

Exercise. — III.

Advance right hand and right foot; straighten the right leg, throwing the body back, and advance the left hand and left foot. Repeat, the left side leading, or alternate in one accent.

Exercise.—IV.

Raise the right hand at right foot. Straighten the right knee, and at the same time lift the left hand and the left foot, one round beyond those occupied by the right hand and the right foot.

Exercise. — V.

Raise and advance right hand and left foot.

Raise and advance left hand and right foot.

Exercise. — VI.

Ascend, one hand on hip. Advance right foot and right hand. Follow with the left foot. The left hand all the time on the hip. Repeat, right hand on the hip.

Exercise. — VII.

Ascend both hands on the hips.

Exercise. — VIII.

Ascend in all these ways from the under side of the ladder. (Fig. 57.)

Exercise. — IX.

Ascend by the hands only, the body hanging straight, feet together.

An endless variety of exercises can be made from this simple apparatus, which, with a little ingenuity, the performer can evolve for himself.

ADDITIONAL EXERCISES WITHOUT APPARATUS.

1. Steady the poise by one hand against the wall or on the top of a chair.

Rise and fall slowly on tip-toe. All the muscles of the foot and those of the back of the leg are exercised.

2. Push down upon the heel straightening the ankle. Let the ankle back slowly into position.

This exercise renders the ankle-joint supple and brings about a pleasant glow of warmth in the feet.

3. Place toes against the wall.

Throw weight forward upon them, bending the advanced knee. The muscles of the back of the leg are thus brought into action.

4. Hold feet close together. Bend both to the right as far as possible.

Hold them in that position. Turn then to the left.

This simple exercise, persevered in, will do much for strengthening those weak ankles that turn so easily in walking.

5. Rotate the feet making the toes, describe as large circles as possible.

Excellent for easily-turning ankles.



FIG. 58.

6. This simple exercise for habitual "cold feet" is far better than heavily and over-thickly dressing the feet.

Percuss the soles quickly and lightly with a small flat ruler.

7. Steady the body, then swing the leg back and forth. The warming effect of this exercise upon the feet will be self-apparent.

8. Stand with feet a little apart.

Rise upon the toes, then bending the knees obliquely outward and forward, sink down. It may be necessary to steady the body.

9. Steady the body. Rise upon the toes. Raise one foot. Sink upon the straight knee slowly.

The effect will be strongly felt in the back of the legs and in the ankles.

10. Steady the body. Let the weight fall upon one leg with bended knee. The other leg hangs free.

Effect similar to the preceding.

11. Kneel. Have some one hold the feet down, if necessary while the body inclines forward. Come slowly and steadily back into position. (Fig. 58.)

12. One foot advanced and raised. Twist body to that side. Avoid overdoing in this exercise.

13. Hands on hips. Take fairly long strides, sink upon the knee with each advance. This is indeed exaggerated walking.

14. Percuss the legs from ankle to thigh.



FIG. 59.

15. Support the weight. Swing leg back and forward; obliquely back and forward; and in circles.

16. Sit in chair. Hands on the hips. Raise both legs—straight.

Raise both legs—knees bended.

17. Support the weight. Raise slowly the leg opposite the support forward. Hold the position.

Extend in backward—not bending the body. Hold the position.

18. Support the shoulders upon a table. Feet as far away as possible. Raise the leg backward. (Fig. 59.)

19. Rotate feet in opposite directions.

20. Slowly raise the legs. Slowly let them return.

21. In same position of trunk, with legs extended and feet together, describe as large a circle as possible.

22. Draw up the knees and describe a circle with them thus flexed.

23. Sit upon a bench or a chair without a back. Nothing better than a couch or lounge.

Carry arms up over head. Throw the body obliquely forward, right and left, trying to touch the floor with the fingers at the farthest point.

24. With arms extended, throw the trunk obliquely backwards, right and left, taking care that the feet remain on the floor.

25. Rotate the extended arms.

26. Reach as high as possible with extended arms.

27. Rotate the trunk, hands on hips.

28. Lie flat upon the couch, hands at sides. Rise *in that position*.

29. Same, with hands folded on chest.
30. Same, with hands clasped on the top of the head.
31. Seize the bed-post at arms' length. Let the feet be a little farther distant from the bed. Now slowly throw the weight forward, bending the elbows but keeping straight the knees until the face is near the hands. Hold position, and gradually return to the erect position.

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